SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1387.—Vol. XXXII.] LONDON, SATURDAY, MARCH 22, 1862. [WITH JOURNAL] STAMPED.... SIXPENCE. UNSTAMPED. FIVEPENCE.

ON PENETRATING DANGEROUS GASES.

The accident at New Hartley has rendered interesting any contribution what we may term the literature of deadly gases. We have had dissations on the subject in nearly every newspaper and periodical that ms to be considered scientific, and with tiresome iteration carburetted rogen, carbonic acid, and carbonic oxide have appeared in their pages. have been told of what they consist, how they are formed, and where are to be looked for; in what manner they operate, and what are the lts of their operation. But very little has been said about the way in ch they may be penetrated—by what means animal life may be susd in their midst. And yet we can hardly conceive of a subject more ortant to the mining interest. Enormous expense has often been inred, and loss of life involved, in attempts to clear out the workings of es where a large quantity of dangerous gas has accumulated. In cases xplosion, especially, every reader of the Journal is aware that long costly delay frequently occurs before the gas can be driven from its nghold, and the exact nature of the accident ascertained; whereas, e it possible for a party of explorers to enter the treacherous mixture might be able by only slight exertion to disperse it, or, at least, they ld acquire valuable information about its origin and extent, and the easy method of restoring the ventilation.

few years ago the Belgian Government offered a prize of 2000 frs., the Royal Academy of Belgium its gold medal, for a good, simple, safe mode of enabling a man, or a party of men, to penetrate and act in underground excavations filled with dangerous gases. We do know if the award was ever published: we believe not. At all events, are in ignorance of the name of the fortunate recipient, and of the racter of his invention.

mong the competitors was Mr. Hall, of Newcastle on-Tyne, whose tical experience in coal mining operations has often been put to good unt, and the result recorded in the pages of this Journal. This gen- an devised a plan based on a principle analogous to that of the com- diving-bell, and illustrated by numerous diagrams. Of course, if a can obtain atmospheric air sufficient for purposes of respiration with- uting either it or himself into communication with the gas which unds him there can be no possible danger, and the object is accom- ed. And this is what Mr. Hall in the plan submitted to the Belgian rnment undertook to supply. He proposed, first of all, to place y-pipes of metal, gutta percha, or any solid substance, permanently e thill of the main galleries of a mine in the direction taken by the and extending from the top of the downcast shaft into the workings, back through the return to the upcast. The circulation of air through e pipes was to be constantly maintained by means of a pump, steam- urnace, or other means used in ventilating the mine. Boxes or joints tervals of 40 or 50 yards along the pipe were to be provided, for the ose or stopping, or trapping, the air, so as to guide it through port- tubes into an air-tight dress—hereafter described,—or into safety- mbers, where the workmen might take refuge, or into other safety-pipes ersing the bords or galleries. These boxes, or joints, were to be made cubical form, with slides on the top, which being withdrawn would into a groove the end of a double portable tube, made of any flexi- aterial, the apertures of the flexible tube being of the same diameter e apertures in the permanent pipes, a stopper being provided to shut e air, and direct it into the flexible tube. The portable tubes were used for the purpose of penetrating the mine, by first fixing one end rap, or stopper, and the other to an air-tight dress, or casing, in the person penetrating the vitiated air was to be enveloped. This n in proceeding forward would reach the next trap, or stopper, where s provided with the means of detaching the end of the tube from the stopper, and affixing it to the one at which he had arrived. The vance for effecting this is simple, but if two persons entered together, was recommended, they could do so by means of the same tube, hus mutual confidence be inspired, mutual assistance rendered, and ork of exploration more speedily accomplished. The air-tight dress ich the explorer was to be clothed might cover either the whole or part of the body. In either case there was a belt of brass, or other , to go round the waist, having an overlap, for the purpose of uniting pper and lower portions of the dress; such belt being constructed pertures and slides, similar to those in the permanent pipes, for the se of attaching one extremity of the flexible tube thereto when ne- y, and carrying the air inside the dress.

upper part of the dress covered the head, a piece of glass enabling earer to see his way, while the fresh-air tube discharged its contents below the chin, and the foul-air tube received the produce of respi- as the top of the forehead. A pipe, having a self-acting valve it, could be placed in communication with the brass belt, so as to of air being forced through it by means of a pair of bellows, from ide of the dress, in order, for instance, to supply pure air and other atives to any persons who might have been injured by an explosion, re still alive; and for this purpose the sleeves could be made suffi- wide to allow the withdrawal of the arms to the inside of the dress. etal belt was to be kept in its proper place by means of leather straps d to the body, and hooks were provided on which to suspend one e reserve coils of flexible tube, a large pouch, and a safety-lamp. ry case of explosion the designer recommended that the dress should on at the top or the bottom of the shaft, even though it should happen e shaft and main galleries might be free from gas, the general rule that deteriorated air is encountered before the locality of the explo- attained. In order to test the quality of the air in a mine after an on, and its capability of sustaining life, it was recommended that plorers as they advanced should observe the effect of the air on some animal, by which observations a pretty correct judgment might be as to the probability of any of the miners surviving amongst the inated air or gases. The safety-lamp was to be enclosed in a pro- ering of metal and glass, the air being supplied to it by means of a ached to the metal belt. The heated air might be made to escape op, through double gauze, with a mesh of 10,000 holes to the square and protected by a self-acting valve; or it might be carried off by of a return tube inside the dress, thus assisting ventilation without or inconvenience. At each junction of the main pipes, where pro- was made for attaching the branch pipes, a glass case might be against the wall, to contain a safety-lamp lighted, while the ex- went forward. As an additional means of safety for workmen in mines, it was proposed to form safety-chambers, or refuge-stalls, in convenient bords and openings. These safety-chambers to be air- nearly so, and ventilated by means of fixed tubes in connection with the permanent pipes, an entrance being obtained through trap-doors. With the apparatus in working order a means of communication with persons in these chambers and those at the top or bottom of the shaft might easily be established. It was further recommended that a supply of dresses and tubes should always be kept in readiness, and that the workmen should be frequently practised in the use of them.

"What would such a system cost?" is a question that will suggest itself to every reader. Mr. Hall informs us that "A pit that may have a capital of 50,000*l.* employed in conducting it ought to pay for interest and redemption of capital at least 8 per cent., or 4000*l.* per annum. The extra sum required in order to have the apparatus and its appendages always in readiness would form a very small addition to such a capital, and would not be a sacrifice of interest of more than 20*l.* a year; whereas, if an accident occurred, the saving effected by enabling the works to be resumed at a much shorter period than could otherwise be done, would far more than counterbalance the small cost of the apparatus." A plan which professes to accomplish so much, at a very trifling cost, seems to merit examination, and, probably, some of our correspondents will tell us what they think of it, and whether they are acquainted with any other system, combining safety and facility of application with moderate expense, to an equal degree with this of Mr. Hall's.

Original Correspondence.

GEOLOGICAL FORMATION OF THE EARTH—No. XIX.

Sir,—By four sections I have illustrated coal beds and lodes as formed in the earth, and, by a section of the globe, shown the north and south lodes penetrating the earth in such directions as they are found at the depths that man has explored them. I now furnish other sections, which may serve either to illustrate coal beds or a ground plan for metalliferous mines, where the east and west lodes are shifted by north and south ones.

Fig. 1: Nos. 1, 7, and 8 are between parallel north and south cross lodes, where the east and west lode is nearly in its original position. Nos. 2, 3, 4, 5, and 6 are all passed towards the point of the V, as now found.—Fig. 2: Nos. 2, 3, 4, 5, and 6 are all shifted back, so as to show the east and west lode in its original place, by which it will be seen

Fig. 1.

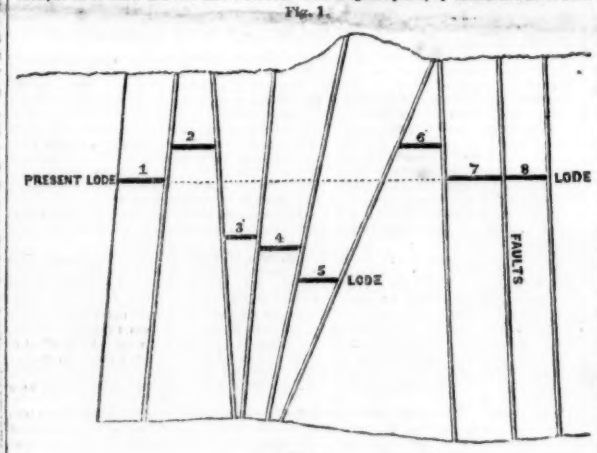
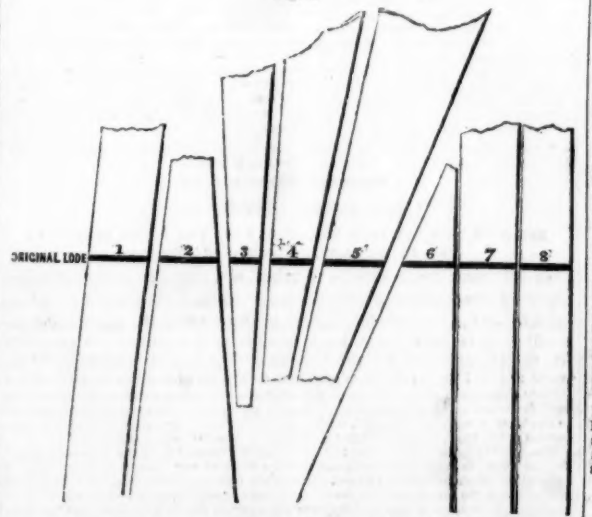


Fig. 2.



No. 5, that appears as a double lode in Fig. 1, is more shortened than the others. I publish this section for the purpose of explaining to or, rather, setting the miner right on moves or heaves, as but few of them will admit lodes are ever found on the side they are generally thought, or said, to have lengthened the lode, as appears in Fig. 1. I have maintained this point for the last 40 years, and once argued it sharply with gentlemen who were then considered the most efficient and leading men of the day for Mr. J. Taylor—viz., Capts. Hitchins and Brunton, who opposed me on the point. Notwithstanding that at first glance the lode would appear to have lengthened, such is not the case, and by placing the pieces to their original positions it will be found the piece I name is shortened more than any of the others between either of the lodes. It is their natural law to shorten, as shown by Prof. Ansted's and all other sections that are true to nature, proving that all goes towards the point of the V. To find a heave it is first necessary you should find the next cross lode, and its bearing to the former. The lode at Pengenna Mine, for which search had been made unsuccessfully for the last 100 years, I discovered at a cost amounting to less than 20*l.*; this lode, a gossan of from 3 to 5 ft. wide, is not so small that it should have been so long missed.

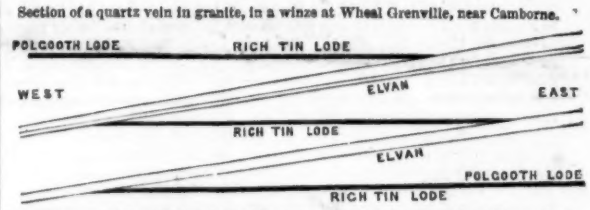
Very few lodes, or coal beds, end at faults. At such places coal beds are either thrown down so much that they are not looked for, or so high that they were washed away by the deluge. The two missing beds in the section by Prof. Ansted are of themselves most convincing proofs of this, and speak volumes in favour of my argument—that the greater portion of faults, or moves, took place before the flood, and without destroying a single coal bed, which, as the Bishop of Llandaff remarked on the stalactites in Cheddar Cavern, were the work of millions of years, and not produced by a sudden upheave or convulsion of the earth.

Nicholas Ennor.

THE GEOLOGICAL FORMATION OF THE EARTH.

Sir,—It is with pleasure I peruse Mr. Ennor's communications: he is generally original and amusing, sometimes instructive; but on one occasion (February 1) he appears to have committed an error, in copying from Professor Ansted, instead of giving us the result of his own observations. He says—"It is clear from the sections referred to, and from sections made by myself and others, where they have been accurately taken from nature, that every shift must be looked for towards the apex of the wedge-piece." After that I should be glad to see an explanation of the following natural phenomena:—

Section of a quartz vein in granite, in a winze at Wheal Grenville, near Camborne.



Plan of heaves in Great Polgooth Tin Mine, near St. Austell. One lode so thrown back as to appear as three lodes.

These are sketches taken from nature by myself, the accuracy of which Mr. Ennor may at any time verify. A miner who had received the dictum of Mr. Ennor's communication would hardly be prepared to look for any lode in the position herein indicated. Believing that gentleman to be, as myself, a searcher after truth, I do not doubt but he will be pleased to have these hard facts brought before him, although they do appear to militate against his hypothesis.—*Redruth.* W. Tregay.

THE DISCOVERY OF GOLD IN AUSTRALIA AND INDIA.

Sir,—I have been much pleased by the letter of Mr. G. F. Goble, relative to the discovery of gold in India, as it proves that your Journal admits the truly English principle—"Speak the truth, and shame the devil." If Capt. Ayrton met with such undeserved treatment in India in 1852, what could I expect in 1831 in Botany Bay?

In fact, the discovery of gold in Australia is yet a mystery, as the first random finders of nuggets (convicts), were either hanged or punished for having stolen and melted the gold.—My case was shortly this:—Having studied mineralogy under M. Brochant de Villiers, at Paris, and Mohs, in Vienna, I arrived at Sydney with a full supply of books, hammers, &c.; but in merely broaching the subject of the mineral capabilities of the vast continent of New Holland, even persons of rank, like my kind host, Mr. M'Dowell, Her Majesty's Solicitor-General (still alive), met it with a smile, amounting to derision, because the Sydney "Masters of the Mint" (Mr. B., the mineral surveyor, and others) had declared that "there was not one particle of any useful mineral in the whole island." Amongst the few persons who believed in me was Mr. Laidley, Deputy Commissary-General; but what could he do against the open and *hidden* arguments adduced against me, which latter would have obtained for Capt. Ayrton 100,000*l.* to keep his secret. And as it happened before, that one man drove a whole country mad, in this case a whole country drove me from off my basis; because, when I came from the Australian Alps in 1834, and had some tangible specimens of gold in quartz with me, I ought to have insisted that they should have been carefully examined there and then; but I deferred the whole affair, which, mark well, seemed then one of "only a scientific bearing." When I came to London, in 1838, with a collection of about 300 mineralogical specimens, mostly all square, flat, and shaped *secundum regulam artis*, I met with the same neglect; and even crystals 3 inches long, of Baycalit, attracted no attention until Mr. Konig bought some of my specimens, at 10*s.* a piece, for about 40*l.*, for the British Museum.—I shall conclude by saying that in the seven and a half sheets of my printed "Journey to the Australian Alps," there are at least 100 sorts of minerals mentioned. Copies of the book are at the Colonial Office, Downing-street, and the Library of the Geological Society.

I beg to enclose you a very curious document—the prospectus of my "Australian Mine Exploring Company," as copied from the files of the *Sydney Gazette* (1833), in the Colonial Office. I need not add that I have not much reason to be *ashamed* of the final result of Australian mining, of which I have been the humble originator! As London is now filling with Australians, some of whom have known me in Sydney, I beg you will allow an inspection of my prospectus by those interested. Dr. J. Lotsky.

40, *Gower-place, Euston-square.*

GUNPOWDER MADE WITH NITRATE OF SODA.

Sir,—Observing in the Journal of March 8 that a patent has been taken out by parties at Manchester to make gunpowder with nitrate of soda, instead of nitrate of potash, it may be useful to the parties engaged, and to prevent such unservicable powder from getting into the market, to state that during the French Revolution and the war with France, when saltpetre was scarce and dear, trials of nitrate of soda were made, without success, in many instances. I will merely mention one at Essonne, 63 years ago. The usual process and proportions were used. The powder was found to inflame more slowly, and its projectile force was much less than that of common gunpowder. This salt also sub-deliquesces on exposure to the air, which renders it totally unfit for gunpowder. Nitrate of ammonia was also used, with the same, or rather a more evil, result. Manufacturers had better remain content with the three ingredients used from the earliest times, paying attention to their proper purification and incorporation, and particularly to the nature and preparation of the charcoal employed, which ingredient is of the utmost consequence.

Samuel Parlby,
Lieut.-Col. late Bengal Artillery.

THE PRINCIPLES OF GEOLOGY.

The fourth of Prof. MORRIS's course of evening lectures on Geology at University College was very interesting, the Professor's object being to give a brief description of the agencies at present in operation on the earth's surface, in order to enable the student the better to understand the arrangement and origin of the various fossiliferous and other strata which have been formed at different periods, and constitute a large portion of the earth's crust. We must consider the phenomena which occur on the surface and those which take place below, both producing certain and characteristic results. The following table, adapted from M. d'Archiac, affords a view of these two classes of phenomena; the one comprising the products of causes which act directly on the surface of the earth, and modify it; the other embracing the phenomena which take place below the surface:—

A.—Agencies acting on the surface, and giving rise to products.

ATMOSPHERIC AND TERRESTRIAL.....		Decomposition and alteration of rocks. Vegetable mould. Falling and slipping of rocks. Showers of dust, &c. Dunes.
LACUSTRINE, FLUVIATILE, &c.	Aqueous and solid.....	Ice, glaciers, floating ice.
	Inorganic	Freshwater deposits. Salt lakes and chemical deposits. Alluvium of rivers and torrents. Action of water on rocks. Deltas.
	Organic	Turf-bogs. Peat-bogs. Shell marl. Infusorial earth.
MARINE, OR SEDIMENTS FROM THE SEA.	Inorganic	Icebergs. Wearing of coasts. Deltas. Submarine forests. Submarine deposits. Shingle beaches.
	Organic	Coral reefs and islands. Shelly deposits. Foraminiferous mud.

B.—Phenomena of which the origin is below the surface, and give rise to products, or produce effects only.

GASEOUS, BITUMINOUS, &c.	Inflammable gas, naptha & petroleum springs. Lagoons of Tuscany.
AQUEOUS	Mineral and thermal springs. Tufa and travertin, &c.
VOLCANIC	Modern volcanoes. Earthquakes, elevation and depression of land.

The surface agencies may be divided into three or four groups—atmospheric, aqueous, chemical, and organic. Most of us are familiar with the fact that the surface of the earth is continually undergoing change by the destructive agencies brought about by nature. In proportion to the hardness or durability of the rock so will it take a longer or shorter time for these agencies to act upon it. If we take, for example, any of the mountain masses uncovered by vegetation at the present time, we shall see the destructive effect of wind and rain upon them. No better example of these first effects could be given than by a reference to the granite Tors of Cornwall and Devonshire. These rocks, which are now isolated and standing boldly out in relief, were once continuous parts of some older mass, and their change has been caused, at least in part, by atmospheric agencies. The disintegration has been effected—first, mechanically, by the action on the mica of the granite by the permeation of water among the laminæ of this mineral; and further, chemically, by the decomposition of the felspar. These two agencies are much assisted by the wind and rain, which are of frequent occurrence in those districts. The Tors of Devonshire, as Haytor for example, present some very peculiar features. Though granite is generally considered as an igneous rock, it must be remarked that there are evident traces of bedding, and that this rock also presents a jointed structure. The bosses of granite of these districts may never have been protruded as such, their present position at the surface being due to the removal by denudation of the sedimentary strata which formerly covered them. The granite is much softer in some places than in others, and readily crumbles away, forming a loose kind of gravel. The Aiguilles, or needles of granitoid gneiss, which form the picturesque summits of some parts of the Alps, and the so-called "Sea of Rocks" of the same mountains, are also further examples of disintegration. Besides which large portions of rocky matters are carried forward by the movement of glaciers, and deposited at their termination, forming the mounds of gravel known as moraines. The decay of granite is intimately connected with the formation of porcelain clay; the kaolin, or porcelain clay, of Devon, the Limoges, &c., is the corresponding mineral substance to the petunze of China. Of the three ingredients of which granite is ordinarily composed, it is the felspar which yields the porcelain clay. Kaolin is a decomposed felspar, without the silicate of potash, and we have good instances of the formation of this clay around St. Austell, and other parts of Devon and Cornwall. The porcelain clays of France and China are also produced by the decomposition of granite rock: this decomposition is frequently seen in pegmatite, which is composed of felspar and quartz, without mica. It is scarcely necessary to call attention to the fact that the decay of unprotected rocks takes place according to the compactness, or crystalline character, of the rock upon which the destructive influence is brought to bear; but the student should make himself acquainted with the processes by which the disintegration of rocks is the more readily effected. Ice also assists in the disintegration of rocks; the water becomes frozen, the fissures are thereby enlarged, and the particles separated.

Under the head of aqueous agencies, the Professor referred to the action of rain, rivers, and seas. The mountain torrents carry down the disintegrated materials, leaving the larger boulders on the mountain sides, while the finer detritus is either deposited in the river valleys, or carried on to form deltas, or the sand bars found at the mouths of many rivers. In rivers we have another effect of aqueous agency: take, for example, the deposition of mineral matter in inland lakes. The River Rhone, derived from the melting of the glaciers of the higher Alps, brings down and deposits in the Lake of Geneva a large amount of mineral matter, the finer portions of mud being spread over a considerable area of the lake, while the coarser parts of sand and gravel are more rapidly deposited near the shore, forming the gradually increasing delta; the water thus losing its turbidity, quits the lake as a clear stream. The material brought down and gradually deposited is a sure evidence of the strata which exists in the regions through which the stream has passed. This is a sample of deposition in an inland lake; at other times the material is carried on to form deltas or sand banks, but the mode of deposition is the same. The Professor here explained a diagram, showing the extent of country drained into the several oceans, remarking that according to the direction of the water shed of the country, and just in proportion to the area, so we shall get different deposits, according to the nature of the strata through which the rivers flow. The drainage areas, or valley systems, having probably received their first configuration during the rise of the surface from beneath the bed of the sea, thereby forming channels which became subsequently modified and enlarged by river action.

The turbid waters of the River Amazon are visible for 200 or 300 miles from the mouth, showing the extent to which mechanical suspension is kept up. The deltas of the Nile, Mississippi, and Ganges may be given as examples of river action in the formation of land. The delta of the Ganges is 200 miles long by 100 miles broad, and 400 or 500 feet deep; it consists of different mineral deposits—alternations of sand and clay, with layers of shells and vegetable matter. The study of deltas is of practical use to the geologist, for if we understand how Nature is carrying out her work at the present time, we shall be able to understand that which took place at former periods, such for example as the fluviatile strata of the Wealden and Purbeck, the former occupying certain portions of Kent, Surrey, and Sussex; the latter is well developed in Dorsetshire.

The power of running water to erode channels in hard rocks is well seen in many localities: thus, in Auvergne the streams have excavated chasms in the solid beds of lava to the depth of many feet. In the volcanic district of the Eifel the deposit of trass in the valley of the Bruhl has been deeply excavated by the present small stream. That rivers have materially modified, if not entirely formed, the valleys through which they flow must be admitted, as many rivers have occupied a larger area than at present, and are excavating strata which were deposited by some ancient stream. The ravine of about seven miles in length between Queenstown and the Falls of Niagara is a striking example of the gradual excavation of a deep valley. This chasm, varying from 200 to 400 yards in width, and from 200 to 300 ft. in depth, has been in progress of time excavated by the power of the river acting on the strata, the nature and arrangement of which, the dip to the south being about 25 ft. to the mile, having facilitated the process. The water at the falls flowing over the Niagara limestone undermines and disintegrates the soft shale below, thereby causing the hard rock above to be gradually unsupported and brought down, which process is further assisted by the effects of frost and wind.

With regard to the action of the sea, it must be remarked that not only the waves but currents also effect the disintegration and destruction of the cliffs of all countries. On our coasts the difference of wave action depends on the hardness of the coast line, and thus it is that we have on the eastern side of our island more rounded contours than on the west, where the rocks present a much more jagged appearance. On the east coast we find soft sandstone, limestone, or chalk, which more readily give way than the metamorphic or older palæozoic rocks on the west. The general effect of this disintegration is to produce not only gravelly beaches, but deposits of sand and mud, which are carried out and arranged in the deeper part of the sea. The Chesil bank, on the coast of Dorsetshire, about 16 miles long, connecting the Isle of Portland with the main land, affords a good example of a shingle bed produced by the particular direction of the tides, breakers, and prevalent winds, being here generally from the south-west. The pebbles decrease in size from one end to the other, showing the direction in which the action has taken place. This is the general direction of the action along the south coast, the gravel being found usually tightly packed on the western side of the groins, and not on the eastern. We must also consider that if the beds have a moderate inclination to the action of the waves, they are not so much acted upon as when the rock presents a vertical face. It sometimes happens that by the disintegration of one portion of the rock there is a protection given for the other portion; thus, at Holderness, Yorkshire, the softness of the stratum (boulder clay) permits the boulders to be washed out, and these form a barrier which, to some extent, prevents the more rapid action of the sea, but when the boulders have been taken away the action continues to bring down fresh portions of the cliff. To turn to chemical agency, we find that this may sometimes arise from springs. Many are familiar with the petrifying nature of certain springs from limestones; which simply deposit the carbonate of lime on any bodies over which they flow: hot springs also readily part with their calcareous matter. As an example, the pisolitic rock which has been formed at Carlsbad, Bohemia, may be cited. These springs vary in temperature from 50° or 60° to 160°, the Sprudel being the hottest. The Sprudel is largely charged with carbonate of lime, and deposits this lime upon the banks and stones in the form of a thick calcareous matter, occasionally coloured with oxide of iron. The pisolitic rock consists of portions of calcareous matter, which are arranged concentrically around some central nucleus, probably a grain of sand. The grains of pisolite having been subsequently cemented into a solid rock, enables us to explain the probable manner in which some oolitic strata have been formed. The granular variety has probably been produced in a somewhat similar manner. By the same process we are enabled to understand the shore accumulations in certain countries, which consist of agglutinated masses of shells, corals, &c., cemented by calcareous waters; and thus it will be understood to some extent how rocks are formed by chemical action. Lastly, attention may be directed to the rocks which occur at Guadaloupe. In the British Museum there is a mass of agglutinated rock in which a human skeleton is embedded, and it is evident that the rock must have been a soft incoherent mass at the time when the remains were cast upon the shore, and subsequently consolidated, so that time must have elapsed for the formation of the matter around it, and for its consolidation; and similar indications of time are afforded if we turn our attention to the oolitic or carboniferous series, in which the exuviæ of mollusca and other animals are consolidated into hard building stone.

THE CIVIL WAR IN AMERICA.

ACCURATE DATA ACQUIRED DURING A RECENT TOUR.

As any information relating to the contest at present going on in the United States will be read with avidity, we may direct attention to two handsome volumes,* bearing the appended title, and written by one whose notes have all been acquired on the spot. The work, though intended for popular reading, is evidently calculated to excite sympathy in this country towards the Confederates. As the mineral resources are but scarcely alluded to, there is, consequently, little which we feel justified in extracting; yet it must not be supposed that our readers will find nothing to interest them, since there are certain narratives which will be found highly amusing. Before we have gone through many pages, for example, we meet with a sketch of the history of "Lynchburg," which is not altogether uninstructive:—

"During the halcyon days of Lynchburg, and when it was the centre of fashionable resort, a speculative 'Yankee' adventurer, as the story goes, purchased a plot of ground contiguous to the town. He dug a well on the premises, supposed to have yielded a strong mineral water, similar, it was considered, to the celebrated springs in the mountain region. The announcement of the discovery caused some excitement. Visitors tried the water, and found it different in colour and taste to what that fluid generally is. The report of its virtues spread rapidly, and numerous invalids resorted to the yellow fountain at sunrise. Even the Faculty recommended the use of the water, especially to patients whose diseases were imaginary. Its good effects were felt or fancied, so long as it was drunk in moderation and at an early hour, for the sun dispelled its virtues, and as he rose they fell. Young ladies resorted to the spring, which they found to deepen the hue of the roses on their cheeks, and juveniles of the opposite sex went to fill the glasses and admire the roses.

"Finally, a suggestion was made to the prosperous proprietor that a regular hydropathic and Hygeian establishment should be opened for the convenience and benefit of invalids, and the advantage of the city. A handsome sum was at the same time offered for the property: the bargain was closed, and the Northern sharper, having pocketed the proceeds, retired from the neighbourhood. After awhile the waters were considered to have lost their pristine virtue, a circumstance at first attributed to an unusually heavy fall of rain. A season of drought, however, succeeded, but did not enhance their strength, so it was resolved to have the well cleansed and examined. The process was duly commenced, when, to the dismay of the new proprietor, upon reaching the bottom, sundry bags of brimstone, rusty nails, pieces of iron, *et hoc genus omnes*, were discovered. The saline and other soluble ingredients had long before disappeared."

Then we go on to Richmond and the neighbourhood, where the familiar title of Tredegar Works reminds us that the manufacture of iron is carried on, and also of the early history of the locality:—

"Richmond contains several ironfoundries, some of which are on a large scale. The Tredegar Works are the principal, which immense establishment covers thirty-two acres of ground. I was kindly conducted over it by the proprietor, Mr. Anderson, and was perfectly astonished at its extent. I observed rolling-mills, cannon and other foundries, machine shops, and locomotive works for all manner of iron operations. Huge Dahlgren guns were being cast and bored, while an almost countless number of shells, shot, and cannister were plied in various apartments and in the yards. One portion of the building was appropriated to the manufacture of gun-carriages, caissons, ambulances, boarding-pikes, &c. The boilers and machinery for several of the largest United States' ships of war were constructed here. So far the Southern Confederacy has been exceedingly fortunate.

"Adjoining the Tredegar Works is the State Armoury, which is apparently getting into a condition of desuetude. It was erected shortly after the adoption of the celebrated 'Resolutions of 1798-1799,' when the apprehended encroachments of the Federal Government on 'State Right and Strict Construction,' induced Virginia to prepare for the worst. At this establishment the manufacture of arms and artillery, from pistols to thirty-two pounders, was carried on for many years. I believe, however, it is proposed to resume the manufacture of implements of warfare, and to introduce all the recent improvements."

The second volume is fully as interesting as the first, with which it forms a pleasing popularly-written diary.

"Down South," while presenting a mass of valuable authentic particulars, acquired during a recent tour by a very competent observer and referring to existing matters in the United States, of considerable interest to those immediately concerned, forms a most amusing work for the general reader, however apathetic he may be as regards all that relates to the interests of either North or South.

* "Down South; or, an Englishman's Experience at the Seat of the American War." By SAMUEL PHILLIPS DAY. London: Hurst and Blackett.

THE FAMINE IN THE WEST.

BEING AN ENQUIRY INTO THE CAUSES OF THE CRISIS IMPENDING IN THE WESTERN DISTRICTS OF IRELAND.

In estimating the capabilities of Ireland as a field for mining enterprise, one of the most important points for consideration is the state of the labour market; and any reliable information on that topic or the condition of the working classes must always be of interest to our readers. A pamphlet has recently appeared in Dublin, entitled "The Famine in the West,"* the work of Mr. Day, an English gentleman who has for some years been resident in Mayo, and whose statements bear evidence of a close and intelligent observance, and of care and accuracy in his notes. Though his observations are nominally confined to the West of Ireland, they may, with little modification, be safely applied to a large portion of the Land, except the more favoured districts of Ulster and Leinster.

The author correctly states that "in the West of Ireland" (and the following observations admit of a far wider application) "the want of any considerable and regular demand for labour has created a most unfortunate competition for land. In the garrets and cellars of the towns are to be found hundreds of families on the watch for a vacant holding; the vacancy occurs, and they eagerly compete for it; the rent is run up without any regard to its real value; whatever conditions the landlord may impose are blindly acquiesced in; and, finally, the tenant settles down in a holding at a rent which both he and his landlord know the land will never pay."

Describing the condition of such tenants, premising that in the immediate neighbourhood of considerable towns their circumstances may be better, the author says—"Scattered along stormy and mountainous tracts of country, the cottier-tenant of the class I am describing generally holds from year to year some five, ten, or, at the utmost, fifteen or twenty acres of land; agricultural improvement has not reached him, and he cultivates his holding in the same rude fashion his ancestors did generations ago; his crops are generally confined to potatoes and oats, or rye, and these he takes alternately off the same soil, until at length all the qualities which tend to produce these crops are exhausted, and the land is suffered to lie waste. For miles along certain parts of the country may be seen land utterly worn out, and left to grow the scanty and sour grass, which alone it is now able to produce.

"The cabins in which such tenants live are sometimes built of stone roughly dashed with mortar or mud, sometimes they are built of mud, sometimes of turf, plied one over the other, and in several instances I have seen hovels, three sides of which were formed by cutting away the bog on the side of a hill, thus leaving the live bog to form three of its sides, and the fourth by building up some of the sods so cut out into a front wall. A common type of hovel is one consisting of a single room, 17 or 20 feet long, at one end of which the cattle herd, if the tenant has any, while the family sleep at the other. Generally, but not always, this room is divided into two parts by a wall run across it.

"Soon after the potatoes are planted, the tenant leaves for England, or for some more prosperous part of Ireland, where, by haymaking and harvesting, he may save sufficient money to pay his rent; he lives penuriously, often walks fifty or sixty miles in twenty-four hours in search of work, or to reach his destination, and finally returns his hovel with 6*l.* or 7*l.* in his pocket, which is paid to his landlord. In the meantime his wife and children attend to the land, and the entire means of livelihood that they possesses are the crops they derive from it—there is no Saturday night in which husband can look forward—there is no needle-work—no household employment which the wife can obtain funds.

"By this miserable system the tenant is kept just above starvation. When prices are high and his crops good, he may manage to buy an additional heifer or a few sheep; mountain sheep, the landlord receives his rent, and the country wears an air of comparative prosperity; but the system is a fair-weather system, and the least reverse upsets the balance."

If our space permitted, we should gladly make several extracts from this pamphlet, in order to show the wretched condition of the cottier, and the frightful suffering which, like the present, of dearth of fuel and impending famine, necessarily entails.

One of the most legitimate and efficient remedies for the existing state of things will be found in the creation of a demand for labour, and, no matter from what quarter the demand arises, the result must be a beneficial one to the now all but starving class; and this demand for labour could be opened up by mining industry, which Ireland admits of indefinite extension, if promoted with skill and integrity. The miserable cottier might be transplanted from over-populated districts to such as would afford employment to the hardy Irish labourer, who, when decently housed and well fed, is rarely, if ever, excelled by the labourers of any other nation. The undue competition for land, which the author deplores, would be mitigated, and a race of men, accustomed to manual labour and anxious to obtain such at comparatively low wages, would be created. One difficulty, however, exists at present which the Irish landlords set up to have it, therefore, in their power, as it is their duty and interest, to remove. Hitherto it has been usual in mining leases to stipulate that the lessee of the mines shall build no cottages for the common miners or labourers. Can anything be more absurd? lessee covenants to employ a certain number of men, and is, at the same time, prohibited from building houses for them to live in—the consequence is, that strangers who will be willing to supply a deficient labour market, having neither friends nor relations such a neighbourhood, can find no house-room, and that those who are fortunate enough to obtain it by some special favour have mostly to travel several miles to and from employment. If the owner of mineral rights foresees that the amount of royalty likely to receive from the mining lease he is about to grant will not compensate ample for any imaginary depreciation of his estate by the erection of a few cottages which, no doubt, would always be of a more sightly class than the mud cabins, it would be better for the mine-speculator, who is to risk his capital and his time in such mineral property should not be leased to him at all.

We cordially recommend Mr. Day's pamphlet to the attention of all who are interested in the Irish labour question and to all those who desire to form a true estimate of the present state and future prospects of the West, and, as we have said before, of the greater part of Ireland—a theme what now occupies much attention, and which the author has thoroughly mastered, and on which he expresses impartial and very valuable opinions.

* "The Famine in the West; being an Enquiry into the Causes of the Crisis Impending in the Western Districts of Ireland, with some Suggestions for the Amelioration of the Condition of the Poor in those parts." By WILLIAM ANSELL DAY, Esq. Bell and Smith, Dublin; James Ridgway, Piccadilly, London.

THE GETHIN COLLIERY INQUEST.—The following was the important evidence given by Mr. Blackwell at this inquest. We publish it in extenso as it cannot fail to prove interesting to all connected with the management of collieries:—

Mr. BLACKWELL having been sworn, made the following statements:—"I have only one visit to the Gethin Pit; that was after the accident, and my observations must therefore, be confined to such as could be made under the circumstances. As a practical man, from the evidence on record, I think the accident may have originated by explosion of gas in No. 19 heading—but the evidence is not absolutely conclusive on that point. There is also a probability that gas swept out of No. 20 cross-heading into No. 19 heading may have been the first cause of the explosion; but on this point, also, the evidence is not conclusive. I think that the gas which is stated to have been found in a hole in the roof of No. 19 cross-heading was probably an indication that gas was coming away continually at that point—very likely from the Yard coal. The low state of the thermometer, to which reference has been made in the reports both of Mr. Evans and Mr. Brough, would no doubt, by relieving the coal from pressure, tend to produce a continuous flow of gas, if that gas had any tendency to escape. The thermometer, too, was comparatively high on that day, and this would cause the air to be at that time rarefied than usual. The ventilation of this pit is maintained by a furnace connected with the upcast shaft or flue; the quantity of air which passes over the furnace in this pit is determined, in a great degree, by the difference in temperature which exists in the column of air descending in the downcast and ascending in the upcast shaft or flue. The air was, therefore, probably slacker than usual on the day of the explosion. As to the sources of the gas which ignited in the subsequent or secondary explosions which are to have evidently occurred, any 'pockets' of gas existing would probably be swept out and pick its course up by the shock of the first explosion. The recorded low state of the barometer on the day of the explosion renders it probable that 'pockets' existed more than usual. It is probable that gas to a considerable extent is actually generated, particularly in a dry and dusty coal pit, by the explosions itself. The blast of the explosion would gather up and envelope in the flame a large quantity of finely-divided carbonaceous matter or coal-dust; and I think it is only by supposing that this dust could take place during an explosion, we can fully account for the extent to which the first blast extend, through the passages of the mine, in the direction of the intake air. The loss of life on this occasion was, as usual, far larger from the destruction of ventilation along the channel by which the intake air entered the pit, than from the injury received from the mere explosion. This resulted from a very defective management of the works of the pit—the separation between the intake current and the 'return' was destroyed for nearly a quarter of a mile along the west level, and this along the only passage by which fresh air could reach the sufferers, or help be afforded them. In this the insecurity of the main intake current was greatly increased by there being numerous lateral openings to the return on the dip, as well as to the rise of that level. The evil of such an arrangement as that which has been described was not only to create insecurity in the maintenance of ventilation, but to cause the obstruction of by far the largest portion of the intake air, and its diversion into the return currents, before the intake air could reach the working places at the west end of the level, where most of the men were suffocated. I think the inevitable conclusion is that the quantity of air carried into those workings has been constantly diminishing in proportion to the lengthening of the west level, inasmuch as the headings have been constantly increasing in number as the level became longer. It appears to have been entirely overlooked that the quantity of air required in any pit should bear a relation not only to the number of men employed, but to the extent of the surface of coal exposed. But while the extent of the surface of coal exposed has been continually on the increase, I believe the quantity of air reaching the workings has been diminishing. From the careful measurements made by Messrs. Evans and Brough, we learn the quantity of air in motion in the pit subsequently to the explosion, and when, excepting so far as that the pit was at work, things had been restored to their normal state—proving that the quantity of air which reached the end of the west level must have been at the time of the explosion quite inadequate, and greatly lower than the standard which experience points out as necessary under similar circumstances. I do not think that, on working days, the west level was comparatively full of men, horses, and trams laden with coal, where the doors leading into the heading were constantly open and shut, there have reached the workings at the extreme end of the west level a quantity more than 3500 cubic feet of air per minute. The point to which the person to whom the management of the mine was entrusted ought to direct his attention, in the first instance, in determining his system of his ventilation, was to get the largest volume of intake possible to the face of the workings; but here it was nearly all allowed to leak away on its course. Another axiom in ventilation appears to have been entirely overlooked, that is, that it is impossible to get air into the workings of any pit if there is not sufficient road provided for it to get out again. I think that with so weak a ventilation at the face of the west level as what appears to have been clearly proved to have existed at the time of the explosion, it was extremely imprudent to work at all with naked lights. There was, moreover, as Mr. Brough has pointed out, a distinct act of negligence committed on the day of the explosion by the day fireman, in sweeping the gas which had accumulated in No. 20 cross-heading out into the working currents, where the men were using naked lights. The men ought certainly to have been withdrawn from the district when this mode of dealing with gas, which had accumulated there, was necessary; all naked lights should have been withdrawn. I think the method in which the west level had been constructed, for about 20 yards along its course by stone headings, between Nos. 14 and 15 cross-headings, presented a great obstruction to the intake air. It is proved in the evidence of Messrs. Brough and Evans that the sectional area of this arching was only 30 square feet; the west level beyond this point was also, on account of the badness of the road throughout this district, considerably contracted. I would require that an air-way should have a sectional area of 50 square feet to pass a quantity of 15,000 cubic feet, at a velocity of 5 ft. per second; and this is the most convenient velocity which can be maintained throughout a working level of this description—a somewhat lower velocity than even this, where men are working with naked lights, would be more convenient; about 5 ft. velocity per second renders it very difficult for the haulters to manage their lights. I think that 15,000 cubic feet per minute of air is the very smallest quantity which ought to have been relied upon for ventilating this pit at the west level section, and that this quantity ought to have been delivered to the face of the works after all loss from leakage had been deducted; an additional air-way would have been needed to get this quantity of air to the face. When I speak of 15,000 cubic feet per minute, I state that as the minimum which ought to have been carried into the west workings; but I think a larger quantity would have been necessary because this would have allowed the works to have been arranged on a system by which all the separation-doors could have been done away with, and under which the ventilation could have only been momentarily disturbed by the explosion, the air returning immediately afterwards to its normal state; but to effect this other changes would be necessary in addition to large intake air-courses. The return air-courses would have to be proportionately inlaid. With air-ways of the sectional area of 16 square feet, and a velocity of 5 ft. per second must be maintained to drag only 4800 cubic feet per minute through such a passage, and that is a velocity which can scarcely be attained in a current winding air-course, at so great a distance from the face as the return air-course is to the western extremity of the workings. This pit certainly occupies a very dangerous position so far as regards the probability of fire-damp escaping into the workings from the adjacent deep unworked coal field to the south. I think this consideration ought to have caused this pit to be worked with safety-lamps alone, and not with naked lights. Still this change, if it had been adopted, ought not to have superseded an improvement in the ventilation, which, I think, when combined with the use of the safety-lamp, is very defective. Nearly all the large explosions which have taken place in this country have been clearly proved to have originated from naked lights, and the presumption is that even where safety-lamps have been used in pits in which explosions have occurred these lamps were defective in their construction, had been tampered with, or that men had carried fuses or something of that kind into the pit. It is well-known that unless a very rigid police is established in pits worked with safety-lamps men will tamper with them. The careful experiments which have been made with regard to the security afforded by safety-lamps, under very unfavourable circumstances, tell us that they are really and practically secure if properly used, and the objections with regard to the light afforded by the old 'Davy' may be met by the use of some of the more modern lamps which afford more light. Most of these lamps, which give greater light than the 'Davy,' may be used with double gauzes, which give great additional security. It must, however, be admitted that inadequate ventilation has been usually found to be the cause of all, or mainly all, the explosions which have occurred; notwithstanding, the immediate cause may have been the use of naked lights. Good and well arranged ventilation—that is, not only an adequate volume of air, but such a system of air-courses as is not liable to be destroyed throughout a great part of the pit by the shock of an explosion, and in which the effects of an explosion are necessarily limited to a narrow district—is what ought to be sought for by every mining engineer in the pits under his charge. *It did not exist in this pit.*"

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

MELBOURNE, JAN. 25.—I have little progress to report of our mining ...na during the past month; no new ground has been broken of sufficient ...ness to induce an extensive rush as in times past. The mining sur...or's returns show a decrease of 4414 of our mining population for the ...t month, most of whom have found their way to New Zealand, and in ...e measure accounts for the decreased returns by escort. The amount ...eived for the four weeks ending Jan. 17, 1862, shows a deficiency of ...639 ozs., as compared with the same period of 1861.

The receipts by escort in 1861 amounted to .....Ozs.		1,832,886
While those of 1860 amounted to.....		2,008,843
Showing a deficiency on the year of .....Ozs.		175,957
The quantity of gold shipped during 1861 was .....Ozs.		2,072,359
Of which there had come from New Zealand		133,270
The quantity of gold received by escort between July 12, 1861, and Jan. 17, 1862, in Dunedin, amounted to .....Ozs.		239,764
And the quantity of gold shipped to the same date from Dunedin amounted to		202,831

...ome silver ore was recently discovered at St. Arnaud, and produced ...siderable excitement in that district, as it appears likely that the ore ...be remuneratively worked,—174 ozs. of the mixed metal was obtained ...m the last lot of 32 tons of stone crushed. When refined it was found ...s metal was composed of 55 per cent. of silver and 45 per cent. of gold. ...ere is reported to be a large quantity of this ore already discovered, ...d different experiments have given from 20 to 100 ozs. per tonne. ...But very little is now doing in alluvial mining in the Castlemain district. ...e Ajaz Company continues to yield very splendid returns. From a re...rt recently published, it appears that from June to December 31, 1861, ...2 tons of stone was crushed, which yielded 4601 ozs. 14 dwts. of gold, ...owing an average of 3 ozs. 3 dwts. per ton.

...A nugget of 7 ozs. was found in a deserted claim at Glengower, in the ...ndoit district; and at Green Gully, Daylesford, a deserted claim, also ...arded two several sets of occupants with nuggets—the first of 47 ozs., ...d the second 33 ozs. 15 dwts. The second nugget was found immedi...ly on the claim being deserted by the finders of the first.

...In Ballarat, we hear that the gold raised by the Great Extended Com...y amounted to 12,655 ozs. during the past year; and that raised by the ...smopolitan to 12,454 ozs.: the former company comprises eighty share...lders, while the latter comprises only forty. The Great Republic, on ...e Inkerman Lead, raised 5594 ozs. 13 dwts. in the same time.

...I casually mentioned, in one of my former letters, that the Heale's Go...rnment had opened facilities for miners taking up 20-acre allotments to ...ld on and cultivate, and that farmers could take up 160 acres; the ap...lications were very numerous. This alarmed the squatters, who manœu...vred, and succeeded by bribery, &c., in once more gaining power, which ...ey had not held many hours before they annulled the licensing system.

C. LEICESTER, Consulting Mining Engineer.

...ADELAIDE, JAN. 25.—Copper has improved in value, in consequence of ...rise in England. The price now asked by the South Australian Mining ...sociation is 96*l.* 10s. per ton at Port Adelaide. Coals are a little lower, ...s of English having been made at 2*l.* 15s. per ton, and of New South Wales at 1*l.* 15s. ...mportant discovery of silver has been made. A farmer, while sinking on his sec... about 14 miles from Adelaide, came upon a lode apparently containing some mineral ...stance, and sent a specimen into town to be assayed for copper. No copper, how... was found, but on making a further assay the specimen yielded 6½ per cent. of ...silver.

...SYDNEY, JAN. 22.—Of the specimens of the natural products of this ...y, now on their way to England to exhibit its wealth in raw material ...e Great Exhibition, few will give a more favourable impression of the ...nt of our resources than those representing our numerous and rich cop...mines. We are happy to be able to report that the mines from which some of the ...valuable of these were obtained are being very enterprisingly and profitably deve... The CADIANGULLONG MINE, situated about 12 miles from Orange, is turning out ...rkably well. The lode is now ascertained to be far more extensive than was re... reported, its width being upwards of 70 feet. The ore obtained has proved sur...ngly rich. The smelting-furnaces are rapidly approaching completion, and it is ex...d that in a very few weeks a quantity of metallic copper will be produced and ...ed. Large quantities of wood are in readiness for fuel for the works, and the esta...ment has begun to wear an aspect of activity. The Cadiangullong Mine is worked ...e Scottish Australian Mining Company, who are represented in Sydney by Messrs. ...head and Young. The CANOBLAS COPPER MINE, only a short distance from the one ...mentioned, is also turning out remarkably well. In driving an adit lately a mag...nt floor of yellow ore was cut. A quantity of the ore is about to be sent down to ...ey for shipment. The Canoblas Mine is being worked by a company, and it is not ...ely that they may make arrangements for getting their copper smelted at the fur... at the Cadiangullong Mine as soon as these are completed, the two mines being ...a mile distant, on the same road. The well-authenticated accounts that are being ...home by every mail of the successful working of these and other copper mines are ...y, in connection with the convincing display of our ores at the forthcoming Exhibi... to attract the attention of English capitalists to them. These mines are very nu...us throughout the colony, and only require the application of capital and enterprise ...come sources of great wealth. The success now attained is likely to give an impetus ...her mining companies, many of which have met with considerable discouragement. ...e Orange *Western Examiner*, of Jan. 18, says—"Within 12 or 14 miles of this town ...is a growing source of prosperity, which will one day prove a greater boon to the ...ict than the outlying gold fields—we refer to the Cadiangullong and Canoblas Cop... Mines. The lode in the former is declared by men who have spent half a lifetime ...e Cornish mines to be superior to any ever discovered in England, and to be inex...ible. In a few months the extensive smelting-works in course of erection will be ...leted, and we shall then send to Sydney an amount of copper that will render our ...s famous throughout the marts of the world. We are informed by a gentleman ...ected with the Cadiangullong Mine that shares are not to be purchased, even at a ...premium—a circumstance arising from the extraordinary depth and richness of the ... this district yielded an average one. Surrounded by all these advantages, it is not ...rising that the Orange district should increase rapidly in population and wealth."

...AUCKLAND, JAN. 9.—The great influx of gold into Dunedin, from the ...go gold fields, still continues. On Nov. 22 and 28, and on Dec. 15, ...escorts conveyed respectively 21,000, 15,000, and 14,000 ozs. The ...l amount of gold brought down by escort up to Dec. 20 is 191,831 ozs., ...h, at 3*l.* 17s. per ounce, is of the value of about 738,550*l.* This is independent of ...s has arrived here through private hands. New diggings are continually being dis...ered in the locality. The Bank of New Zealand succeeded in buying about 20,000*l.* ...h of gold, amongst which was the largest nugget that has yet been discovered, weigh... about 14 ozs. of pure gold, and free, with a slight exception, from quartz. It is now ...seen in Auckland. Three passengers left a few weeks ago by the *Aldinga*, carry...with them 2400 sovereigns: one having 1200, another 800, and the third 400. This ...version of their gold into sovereigns was in order to escape the expense of the exchange ...Melbourne. Gold has just been found in the province of Wellington by some ...ers, who brought a sample of it into town. A subscription has been entered into to ...ect for gold carefully. It will not be long before New Zealand will be recognised ...gold-bearing country, for it is known that the whole of its mountain ranges are au...ous from the south to the extreme point in the north. The quartzose rocks act as ...ase of the formation, and it only requires time and energy to lay bare the golden ...ures which they contain. In the northern island the scoria from the extinct vol...es covers a great portion of the maiden soil in their vicinities, and in one or two in...ces where wells have been sunk to obtain water, the upper crust has been perforated, ...the original rock arrived at which has proved to be the gold-bearing strata.

The following are particulars of the collection of specimens made in New ...land to be forwarded to the Great International Exhibition:—

...pecimen of plumbago from Pakawau, Massacre Bay.
...pecimen of native copper from the Dun Mountain.
...ad rock of the Miner from the Aorere, with scales of gold.
...ad from bed of the Buller River, west coast.
...ad from Waimangaroha, west coast.
...ad from Pakawau, Massacre Bay.
...pper ore from the Dun Mountain Mine.
...rome ore from Marsden's Sett, near Dun Mountain.
...d hematite from D'Urville's Island.
...rome ore from the Dun Mountain.
...rome ore from the Croixelles.
...n sand from the sea-shore west side of Blind Bay; found in almost unlimited ...tity ozs. of gold from Slate River, Golden Bay. [quantity.
...ty ozs. of gold from Buller River, west coast.
...ty ozs. of gold from Takaka, Golden Bay.
...ty ozs. of gold from Golden Gully, Aorere.
...rome ore from Wangapeka Diggings.
...rome ore from Ben Nevis.
...lphur from White Island.
...pecimen of colour (blue) from Nelson Chrome, Dun Mountain.

AUSTRALIAN MINES.

KAPUNDA.—The various operations at the mines were going on much ...ual. The November ores on weight and assay proved to be 376 tons, of 14 per cent. ...age produce, equal to about 53 tons of pure copper, and the yield for December was ...ated at 256 tons. The quantity of copper made in December was 58 tons, of which ...ons had been shipped, per the *Verulam*, from Adelaide to London.

GREAT NORTHERN COPPER.—The committee at Adelaide state:—We ...now making arrangements for the shipment of another parcel of ore on board the ...ad, from Port Adelaide to London, at the freight of 25s. per ton, all through from ...Augusta. We refer you to Capt. Pascoe's reports as to the progress of the mines, ...the works for the engine, &c., by which you will see they are getting on satisfac... and the committee can but hope that on the completion of them the resources ...e mine will be developed to an extent that will prove amply remunerative for the expenditure. We are glad to announce the safe arrival of Mr. Bonny, on the 18th inst.; by next mail you may, therefore, expect to hear fully from him. The *Rangoon* sailed this week for London with the 134 tons of ore on board. Capt. Pascoe reports as follows:—"The engine-shaft at the Nuccaleena Mine is down about 12 fms. below the surface, and closely timbered. The lode in the deep adit end east is 3 feet wide; it is poor for ore, but the ground is as good as I could wish for producing ore. The lode in section 9 is 6 feet wide—3 feet good for ore. The lode in section 8 is still yielding good ore. The lode in section 7 is nealy whole from the winze; it is good for ore. The 10 fm. level is driven through a good lode of ore 25 fathoms long; the ore is from 3 to 5 feet in width."

NORTH RHINE.—The committee at Adelaide state:—You will perceive by the minutes that the sinking of Cope's engine-shaft is being proceeded with, although on account of the ground still continuing very hard the shaftmen are able to progress but slowly. The driving in the 43, south is also being carried on by six men, who have raised about 40 tons of ore; but the lode at present being divided into several branches, renders it for the moment poor. You will observe that Capt. Barkla anticipates coming upon abundance of copper ore between the 43 and the 60 fm. level. The miners have about 3 fms. to sink to reach the 60 fm. level.

YUDANAMUTANA COPPER MINING COMPANY OF SOUTH AUSTRALIA (LIMITED).—A private letter, dated Adelaide, Jan. 25, makes the following satisfactory statements respecting this property:—During my trip north I visited the Yudanamutana Mine, and I was truly astonished at the quantity of copper ore in sight. Capt. James opened the lode on the summit of the hill; it is 25½ ft. wide, about 6 ft. deep, and at the bottom and sides of the hole every description of rich ore is in sight. I would very much wish to see this property worked, as I am confident the results will be the means of attracting the attention of the mining world to our northern mines. The Yudanamutana at the present time looks more like a quarry of copper ore than anything else. Another private letter of the same date says:—The vast richness and good results which must follow the working of the Yudanamutana properties are indisputable.

WORTHING.—During the month the plat in the 43, at Legg's shaft, has been completed, and we have commenced driving north and south. The north end is driven 13 ft. 6 in., lode 2 feet wide, but not to value. Judging from the ore gone down in the 33, we may expect a good lode in 4 or 5 fathoms more driving. The south end is extended 7 feet, but not on the lode. As soon as these ends are driven a few fathoms we shall cut cistern-plat, and commence sinking the engine-shaft again with all speed. The 33 cross-cut has not been prosecuted this month for want of miners, but was let again on Saturday; we shall, therefore, push on this point as fast as possible. The winze in this level, north of the plat, is sunk 2 fathoms; the lode is large, of good work, and is more than the winze wide. In the 33 end south the lode is 2 feet wide, and will yield 5 tons of ore per fathom; this end has been driven the last 20 fathoms through a good course of ore. No. 2 winze, in bottom of the 23, is sunk 3 fms. 5 ft., lode 1 ft. wide, good dredge; this winze is suspended until the 33 end south is brought up closer. The stopes in the bottom of the 12 and back of the 23 are still yielding good ore—4 or 5 tons per fathom. Lean's drawing shaft is down 6 fathoms below the 12—lode poor. We have returned 110 tons of ore within the past month. The machinery, dressing, and smelting departments are doing well, the smelting-works producing about the same quantity of regulus as last reported. Quantity of regulus on hand, 48½ tons—produce, 51⅞. Quantity of wood received during the month, 328 tons.

BON ACCORD.—The directors have received by the present mail a communication from the committee of management at Adelaide, written with the view of assisting the board as far as possible in the task in which they are at present anxiously engaged, of determining the course to be pursued having regard to the existing position of affairs at the property.

ENGLISH AND AUSTRALIAN COPPER.—The smelting operations, both at Kooringa and the new Port Works, were proceeding very satisfactorily. The quantity of coal at Kooringa was 245 tons, at Kapunda 767 tons, and at the new Port Works 1062 tons. The number of furnaces at work at Kooringa was four, and one refinery. The company's horses and mules were all in good condition, and working well.

DUN MOUNTAIN COPPER.—The committee and manager at Nelson, New Zealand, says:—The permanent way of the portion of railway from the port to the foot of the incline in Brook-street is now laid, and on the line from the foot of the incline to the mines the permanent way has been laid to within 2¾ miles of the chrome workings; and the entire line will be completed by the middle of February. We are glad to say that the railway, as far as it is ready for the wagons to run upon, is in very good order, the horses and wagons running along with safety. From the near approach to completion of the railway, we may be allowed to congratulate you on the present month's drafts, being probably the last heavy payments you will be called upon to meet.

WHEAL ELLEN.—Our great object underground is to push on with the engine-shaft, so that we may be enabled to get down in the deep level, where we have in reserve a large quantity of rich ore to take away. We have also four men driving in the 30 fm. level, north of Scott's shaft, at present; the lode is of great width, I cannot say how large, having only one wall; it is composed of mundic. We have also a pitch at work on the copper ore in Spencer's shaft, which at present looks well; the lode is about 1 ft. wide of red oxide, and is going off into whole ground. It is expected that large returns will be obtained from this spot.

PORT PHILLIP AND COLONIAL GOLD.—Mr. Bland, the resident director, reports:—The quantity of quartz crushed during the month was 2626 tons, yielding 1472 oz. 4 dwts. of gold, an average of 11 dwts. 5 grs. per ton; the above includes 344 ozs of alloy, without which the yield is but 8 dwts. 14 grs. per ton. The receipts on Clunes account were 2576*l.* 15s.; payments, 2354*l.* 13s. 11d.; profits, 222*l.* 1s. 1d. The expenditure includes 500*l.* paid for firewood beyond the amount consumed during the mouth, also 379*l.* 9s. 7d. invoice of boiler and fittings now being landed from the *Ambrose*, and 303*l.* 3s. 6d. paid for calcining and delivering quartz. The total outlay per ton of ore crushed was 17s. 11d., and, excluding the above items, 8s. 11d. The return for the quarter ending December is as follows:—9121 tons of quartz crushed, yielding 4639 ozs. 18 dwts. of gold, or an average of 10 dwts. 4 grs. per ton; the receipts amounted to 8142*l.* 5s. 1d.; payments, 6083*l.* 16s. 5d.; profit, 2058*l.* 8s. 8d. The total outlay per ton was 13s. 4d.; ditto, deducting the amount paid for calcining and stock of firewood, and invoice of boiler, together amounting to 2062*l.* 16s.; the cost of crushing was 8s. 9d.; the average amount stamped per week was 658 tons. The return of yield, and consequently of profit, for the quarter is by no means satisfactory. I, however, confidently believe this to be but temporary; the Clunes Company, in consequence of their heavy expenses, are not making any profit, and they have determined at once to commence raising quartz from the northern shaft. In the first instance, they will block out a portion of the Welcome vein, which I have no doubt will again bring up the average to a satisfactory point. I do not remit anything by this mail, having some engagements here, such as stone-breaking machine to pay for, cartage and fitting up of that and boiler, &c., per *Ambrose*, and purchase of a portable engine to work the former, added to which exchange on London has risen 2 per cent., in anticipation of war with America. I could have spared 1000*l.*, but as the board will not want it for dividends immediately I think it most prudent to postpone remittance till next month.

GREAT BARRIER.—Extract from the despatches of the general manager in New Zealand:—I am delighted with the island, and with the nature of my duties, and am quite sure that I shall only require the support and confidence of the directors to make the property highly remunerative, and this it shall be my constant endeavour to deserve. * * * * With the Wairaki Valley both Mr. Brown and myself are in raptures. We both concur in thinking there is no better land in any part of New Zealand. * * * * As for the Wairaki and the land on Kaikoura I am afraid to trust myself to speak about it at present, lest the directors should think me too sanguine. I am inclined to think that Kaikoura, however, if well stocked with sheep would in a few years bear from 3000 to 5000, which would pay amply for capital invested.

SCOTTISH AUSTRALIAN.—The directors have advices from the superintendent at Sydney, dated Jan. 21, with reports from the Good Hope Mine to the 14th, and from the Cadiangullong Mine to the 17th.—Good Hope Mine: In the last report it was stated that the lode had been cut in this property at the depth of 30 fms., yielding 10 per cent. ore, into which Capt. Perry had penetrated 5 ft.; he now reports—"We have penetrated the lode about 10 ft. in the cross-cut at the 30. Our progress with this work has been delayed by our finding it necessary to widen the end of the level, in order that the men may be enabled to blast to better advantage. We now expect to work through the lode much more expeditiously. The character of the lode has not materially changed since I last reported—there seems occasionally to be a considerable increase in the quantity of ore, and again a corresponding decrease—this feature is not unusual." Mr. Morehead states—"The cross-cutting of the lode is being pressed on with all diligence. . . The promise of this property seems as favourable as when I addressed you last month. I hope we shall now get on quicker."—Cadiangullong Mine: Owing to the Christmas holidays and harvest season, some of the miners have been absent from the mine, and operations in the cross-cut from the adit shaft have been somewhat less active since Dec. 21 last, when Capt. Christoe reports—"We were then in something over 5 fms., the floors were still very rich, carrying a large proportion of native copper and red oxide. The lode was much easier for driving through." In the new shaft, called Murphy's shaft, it was expected from the slope of the country that ore would not be met with until a depth of 10 or 12 fms. had been attained. Capt. Christoe, however, reports that—"Just before reaching the depth of 7 fms. we struck a floor of black iron ore, carrying in places a large proportion of blue carbonate of copper, grey and yellow ore." This was passed through, and the men were engaged in sinking through floors of gossan, killas, and mundic down to the depth at which the ore laid bare by the adit shaft and the cross-cut therefrom was expected to be reached. Capt. Christoe goes on to report—"We have started a new shaft for the purpose of supplying the engine you propose to erect with water for condensing. We hope to make this shaft available in many ways besides the use for which it is being expressly sunk. . . . In the stopes we have only two men engaged; they have as yet done little in breaking copper ore, having been more particularly engaged in cutting a wheeling way through the iron ore. In stripping and wheeling away of the overbourne we have three men engaged; they are laying bare a large quantity of copper ore. We have besides two men carrying in an open cutting from the north side of the lode to the south; this we hope to make available for tramming the ore out for some considerable depth, (say) at least 15 fms." Mr. Morehead reports—"I went across to this property from the Good Hope, as I stated to be my intention when I wrote to you last month, and was so satisfied with the position and prospects of the mine as to have no hesitation in deciding that the machinery we had brought out for erection at the Good Hope should be sent to Cadiangullong. The quantity of ore, it may be said, in sight seemed fully to warrant this step. . . . It will be seen that little had been done during the month in the way of raising ore, but that ground was being laid open from which ore in quantity may shortly be expected to be obtained. It will further be seen that a floor of ore, or of orey ground, has been passed through in Murphy's shaft. It will be recollected, I dare say, that we did not expect to meet with ore in this shaft till a considerably greater depth had been reached. The smelting works, everything considered, are getting on very satisfactorily; and I found reason to be in every respect pleased with the progress of matters at this establishment under Mr. Christoe's management. There is not another man (I am satisfied) in the colony who could do for us what Mr. Christoe is now carrying out; and, therefore, his services in developing this wonderful property are of the very highest value to us. . . . I am afraid, I would here remark, even now to attempt to name a time when we may look to see a produce from the smelting works; I would state, however, that I entertain a hope that we may be producing fine copper within six months from the present time—Collieries: The colliery manager had arrived in the colony, and was engaged in surveying a very short branch line of railway from the company's properties to the Great Northern Railway having its terminus in the harbour at Newcastle. The property to be worked by the company, in the first instance, consists of three blocks of land of 640, 320, and 300 acres, lying contiguous to one another, and through the largest of which, being one square mile in extent, the walisend seam of coal, upwards of 9 ft. thick, has been carefully traced, dipping slightly southwards, but with an outcrop just inside the northern boundary. The branch railway will not exceed a mile in length—the total distance of the properties from Newcastle being about four miles. The general purport of the superintendent's advices show that the extent, the coal-bearing quality, the distance from Newcastle, and the facilities for the development of the properties which Mr. Morehead has selected for the commencement of this branch of the company's business are all that could be desired. A number of smelters from Wales are on their way to Australia in the company's service.

NORTH LAXEY MINING COMPANY.

An adjourned general meeting of shareholders was held at the company's offices, Bishopsgate-street Within, on Monday,

Mr. W. F. RAE in the chair.

Mr. J. H. MURCHISON (the secretary) read the notice convening the meeting, and the minutes of the last were read and confirmed. The annexed report of the agent (Capt. Rowe), as also that of Capt. John Kitto (assistant agent at the Great Laxey Mine), were then read:—

March 14.—According to your request, I have this day visited the above mine, and just come from underground, accompanied by John Horsley. The stopes in sole of the 27 are much the same as when you saw them. No alteration has taken place worthy of remark. The 38 south has considerably improved since yesterday; the hanging or western part of the vein is about 1 ft. wide, composed principally of lead and jack, and presents every appearance of a still further improvement; I think the vein, which is now in two parts, will soon fall together, at which point there is not much doubt of its making a bunch of lead. In order to facilitate the working of the mine, and at the same time secure the success which you have good reason to expect, the sinking of the new engine-shaft (which is in the most favourable position, and in the bottom of which is a good lode of lead) should be immediately resumed, and continued for at least 10 fms. below its present depth; this, I consider, would give the mine a fair trial, and from the great improvement which has taken place within the last few fathoms both in the general character and produce of the vein, I have not the slightest doubt that it will lead you to most favourable results. It occurs to me, and, in fact, I think it would to any right-minded man on visiting the mine, that it would be madness in the extreme to talk of suspending operations at this particular juncture, as it appears you have now arrived at, or about, the turning point in the history of the undertaking; all the most expensive works of exploration having been accomplished, and your present prospects most strikingly indicate that you are on the eve of realising the success which you have reasonably anticipated from the beginning. I will undertake to say that if you abandon the mine it will not remain idle, and the work which you have been at the expense of doing will only be so much in favour of the next comers in, for most assuredly it will be worked, if not by you, by some other party.—JOHN KITTO (agent of Great Laxey).

March 17.—For this meeting, adjourned from Feb. 3, I am only able to present a short report; I shall be happy, in addition, to give a verbal explanation of the present position, &c., of the mine, and to answer any questions. Since Feb. 3 we have not met with the expected improvement in the 27, driving south. The new, or 38, has been driven 4½ fms. through ore ground since my last report, varying in value from 1 ton to ⅛ ton per fm.; this end is now 7 fms. from shaft, and all of the average value just given. Judging from the 27, or level above, there should be yet about 25 fms. long of ore ground lying directly before the 38 end, and as there is a clear improvement, both as to the length and extent of the ore, as the mine is carried in depth, I have no doubt the 38 in its further onward course will develope the same results. Seeing, then, that there was little or no valuable ore ground in the 12, but that in the 27 there was 30 fms. long of ore ground, and that in the 38 a lode of 100 per cent. increased value to that of the 27 has already come in, the great desirability of pushing down the shaft with all speed cannot be made more manifest. We are now in a position to resume the sinking, and having left it off in the best lode for ore we had at any time, it is but fair to assume that the mine is at last opening out well, and that it will yield profitable results when another level is reached, and opened some distance. Since the meeting, or within the last five weeks, there have been 12 tons of ore raised, and that from two places only—the 38, and a stope in the bottom of the 27. We have also since Feb. 3 sold 15 tons of ore, at 12*l.* per ton. In conclusion, I have a better opinion of the mine than I ever had before, but we do require a further sum of money to complete the upper part of the new shaft, and also to enable us to sink for a new level, so as to get a sufficient hold upon the long run of ore ground now discovered to be strongly settling down; this done, there is every appearance that the mine will turn on a profitable scale, and the amount so required will be about 1000*l.*—R. ROWE.

The CHAIRMAN said that Capt. Rowe was present, and would be glad to afford any further information that shareholders might desire.

Capt. ROWE was not aware that he could add much to what was stated in the two reports just submitted. There was one remark, however, he might, perhaps, be permitted to make, which was this—that at the 12 the ore was found, so to speak, in little pockets, which although sufficient to lead them on to a further prosecution of the property, was not enough to assume any appreciable value. But when the 27 was reached there was found a continuous body of ore ground for 30 fms. in length, so that, from the 12 to the 27, the ore ground had altered from being of no positive value to a defined length of 30 fms., which of itself, would indicate that North Laxey upon further development would prove to be a continuously profitable mine. In the next level, the 38, those indications were considerably strengthened by an extension of the ore ground, and also by an improvement in its value; for although the 38 was not yet under the best part of the ore ground in the 27, such an improvement had taken place in the character of the ground that, comparing the present end in the 38 with the corresponding point in the 27, it was at least 100 per cent. better. Taking the progressive improvements which had taken place hitherto, there was reason to believe that even in the 38 there would be found sufficient to constitute all they had been looking for. At any rate, there was this fact patent to them all—that the mine was now producing in three months more ore than it had hitherto done in twelve months.

Mr. DARVILL enquired how many tons of ore per month would pay the costs of the mine, including merchants' bills?—Capt. ROWE replied that about 15 tons of ore would pay the whole of the costs. At the present time they were raising 12 tons per month; so that the current returns were paying four-fifths of the costs. But they were not now sinking the shaft, nor completing the upper part of the new one, which he wanted to do to render the mine in a perfect and permanent state of working to prosecute the operations with economy and efficiency. He wanted to sink the shaft 15 fms. deeper, the cost of which would be about 25*l.* per fm.; that, added to the outlay incurred in completing the new shaft, would cost about 750*l.*, against which there would be the ore raised.

Mr. DARVILL enquired how long it would take to sink the shaft 15 fms.?—Capt. ROWE replied that he estimated he would be able to sink about 3 fms. per month, which in the Isle of Man was considered very good sinking. At the time the shaft was discontinued the lode was worth fully 1 ton of ore per fm.; the lode, therefore, at its present value would pay half the cost of sinking the shaft, but in addition to that there was the probability of a progressive improvement. Had the price of lead continued what it was some two or three years ago the present returns would fully pay the whole of the costs of the mine. Their lead was now being sold for 12*l.* per ton.

A PROPRIETOR enquired if they were taking away any ore which ought to be left as reserves?—Capt. ROWE did not consider they were, for they had driven 7 fms. in the 38, where they had put on one bargain, and there was another bargain in the bottom of the 27, from which two points the whole of the returns were being made.

Mr. COTTERELL enquired the distance between North Laxey and Great Laxey?—Capt. ROWE replied that the two properties were only divided by a saddle, the former being longitudinally from the latter about 2½ miles.

The SECRETARY, in answer to a question, stated that the accounts up to the end of January, without crediting the 12 tons of ore at surface, showed a balance in favour of the company of 160*l.*

Capt. ROWE reminded the meeting that when he said 15 or 16 tons of ore would pay the cost of the mine, he did not mean that that quantity of ore would cover the expense of sinking the shaft, or of any extra work that might be undertaken: but that 15 or 16 tons would liquidate the whole of the expenses of the present workings.

Mr. COTTERELL enquired if the 38 end was yet under the best part of the ore ground in the 27?—Capt. ROWE replied in the negative, but he thought that in about 4 fms. further driving they would reach a better character of ore than they had ever obtained. There could be no doubt they were upon the same lode as that which in Great Laxey had produced such satisfactory results. Considering the two mines, he felt himself justified in saying that North Laxey had advanced quite as satisfactorily up to the present point as the Great Laxey had done—that is, taking them at the same level or relative depth. Taking the sea level, North Laxey was 30 fms. higher than Great Laxey; but comparing the two mines at corresponding levels, North Laxey had produced as much ore as Great Laxey—the latter began to make dividends at about the 60. The lode in North Laxey dipped at an angle of 45°, rising and falling with the land. In North Laxey they were working towards the Great Laxey lode, and he fully expected as they approached it—that is to say, as they drove south—the lode would improve even in the present levels as well as in depth.

Mr. COTTERELL enquired if Capt. Rowe could form any estimate at what depth the 38 in North Laxey would be in Great Laxey?—Capt. ROWE replied that the ground in Great Laxey was depressed 30 fms. below the ground in North Laxey, but the lode rose and fell with the land. He believed by the expenditure of 1000*l.* the whole of the work he had referred to could be accomplished, and the mine brought into a successful condition.

Colonel BAZALGETTE asked whether Capt. Rowe intended to convey that in North Laxey ore had been obtained at an earlier period than had been the case at Great Laxey.

Capt. ROWE said that more ore had been found in North Laxey than had been found at a corresponding depth in Great Laxey.

Colonel BAZALGETTE enquired if there was any probability of another lode underlying the present one?—Capt. ROWE replied in the negative. In North Laxey they had, he believed, the Great Laxey lode, and that would increase in value and size.

Mr. WHITE suggested the propriety of not limiting the increase of capital to 1000*l.*; and enquired whether Capt. Rowe felt satisfied in his own mind that 1000*l.* would be sufficient to carry out the work suggested?—Capt. Rowe said it was, of course, impossible to answer that question positively, but he could not see that a larger sum would be required; and that expenditure, he believed, would bring the mine into a paying state. If they came into a great body of ore they might require some additional machinery.

The SECRETARY enquired what quantity of ore their present crushing power would be able to return?—Capt. ROWE replied that would depend upon the character of the stuff, but of the average quality the crusher would be able to return 30 to 40 tons per month. He considered the present machinery was capable of working the mine to 20 fms. deeper. The North Laxey had the advantage of water-power all the year round

The CHAIRMAN said the shareholders present must have been at least pleased with the very lucid statement of Capt. Rowe as to the prospects of the mine. From those explanations, he thought they would all agree that it would be most unwise not to continue the development of the property; therefore, the question was as to the steps to be taken to raise the necessary capital. For that purpose he would propose a resolution to the following effect:—"That the reports of Capt. Rowe, and that of Capt. John Kitto, of Great Laxey, of the 14th inst., having been read, and Capt. Rowe having given a full explanation of the position and prospects of the mine of a very favourable nature, resolved that a special general meeting be held to consider and decide on the best means of raising further capital—say, to the extent of about 1000*l.*—for further opening out the mine, the expenditure of which secondly to bring it into a profitable state." If that resolution were passed to-day, the directors, before the holding of the special meeting would be able to consider as to the means of raising this additional capital, and would, perhaps, be prepared to submit at special meeting some scheme which, in their opinion, would be most likely to raise money at the cheapest rate.

Mr. BRANDT having seconded the motion, it was put and carried unanimously.

Upon the proposition of Mr. NOBLE, seconded by Mr. BRANDT, the following gentlemen were elected directors:—Col. Bazalgette, Messrs. C. Martin, W. F. D'Arcy, J. H. Murchison, and T. H. White.

Upon the proposition of Mr. COTTERELL, seconded by Mr. GAZZANNA, the retiring director (Mr. Brandt) was elected auditor for the ensuing year.

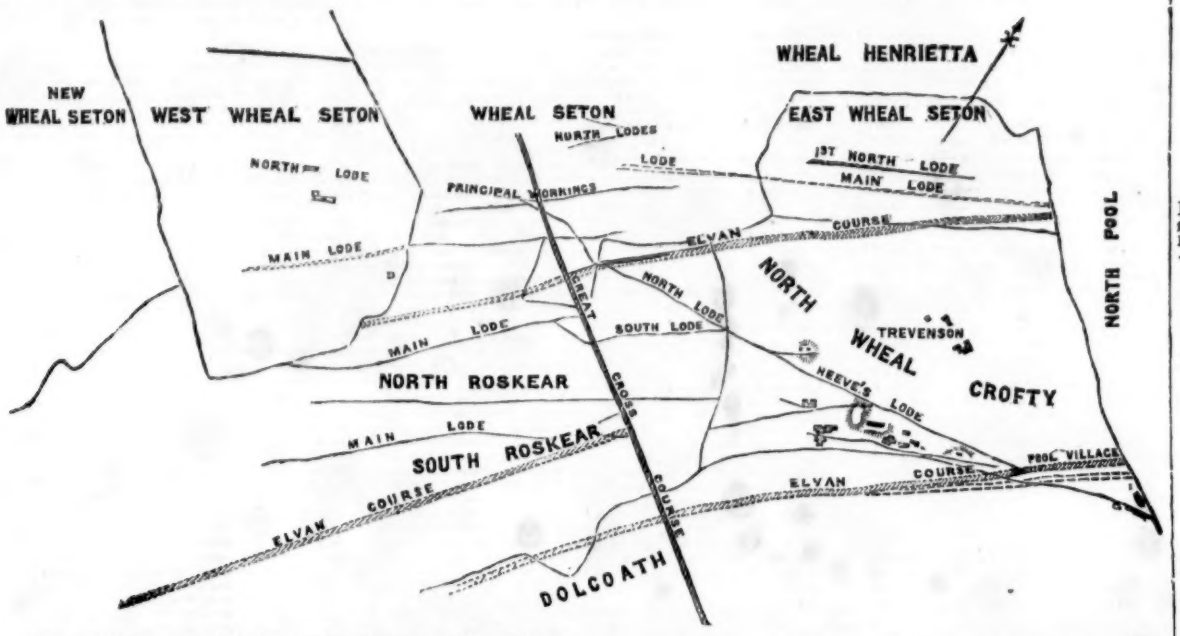
The CHAIRMAN said he might mention that the Great Laxey, which was now making such great profits, came into the hands of a third company before it commenced to declare dividends. The North Laxey was in the hands of a second company, and it would be a pity if the shareholders made the same mistake as was committed in Great Laxey, by permitting a subsequent party to come in and reap the benefit of the outlay incurred by the two previous companies. Although it was but a mere coincidence, it was one with which shareholders should be made acquainted.

Votes of thanks to the Chairman and directors terminated the proceedings.

MINING IMPROVEMENTS.—Mr. [illegible]s. Farrimond, Manchester, has invented an improved safety-cage; Messrs. N. Gisborne and H. Wickens an improved means of indicating the presence of fire-damp, and of choke-damp, and of dispersing fire-damp, and also of telegraphing in mines; and Mr. T. Calow, Stavely, a safety apparatus applicable to cages or hoists used in mining [illegible] lifting-machines.

PLAN OF THE SETON DISTRICT.

MAP SHOWING THE RELATIVE POSITION OF THE SETON MINES, AND OTHERS ADJOINING.



EAST WHEAL SETON, AND THE MINES BY WHICH IT IS SURROUNDED.

East Wheal Seton possesses the most favourable features of the best mines in the midst of which it is situated, and has advantages over every other progressive mine in the same locality, which have only to be pointed out to be generally recognised, and the most prominent of which are the following:—The sett is bounded on the west by Wheal Seton, and is traversed by the lodes of that mine and West Wheal Seton, and by the same elvan course in connection with which the large masses of copper in Wheal Seton and West Seton have been found; but the junction of the lode with the elvan in East Seton will be met with very near the surface, in which respect it is superior to the other Setons, as in those mines it is met with only at a considerable depth. The point at which the lodes have been proved to become rich in copper will, therefore, be reached in East Wheal Seton by a smaller outlay, and without the tedious lapse of time which so often tires out those who enter on mining enterprise. The adit level is being driven eastward, in which direction the lode and elvan rapidly approximate, so that a great discovery may at any moment be made, placing this mine in the same rank with its adjoining neighbours. A call having been made on Feb. 13, no further call will be made for six months; and should a discovery be made requiring the erection of a steam-engine, 10s. per share will be ample to provide all the necessary machinery; and the fact of such being required will at once give a very high market value to the shares.

The high estimation in which ground forming a part of the Seton district, and traversed by the Seton lodes, is held, and the great market value which progressive mines in such a situation acquire, are shown by New Wheal Seton, which occupies the same relative position to West Wheal Seton that East Wheal Seton does to Wheal Seton, and in which the fortunate shareholders find themselves possessed of a property selling for 26,000*l.*, although the mine has not yet commenced selling ore, so confident are the mining public that it will turn out a great prize; and it is evident that East Wheal Seton is destined to command quite as high or, perhaps, even a higher value, seeing that it possesses equally great advantages, and in some respects may be even said to be superior.

In the great mining district in which the Setons are situated there are three parallel ranges of mines, one at the north foot of the granite hills, which form a part of the great chain traversing the entire length of Cornwall, in an east and west direction, and forming, as it were, its backbone. This includes Dolcoath, Stray Park, Camborne Vean, Cook's Kitchen, Tincroft, and Carn Brea. The next, north, includes the north part of Tincroft, South Crofty, and the Old South Roskear Mine; and the most northerly range comprehends East Pool, North Pool, North Crofty, North Roskear, Wheal Seton, West Wheal Seton, New Wheal Seton, and East Wheal Seton. The earliest of these mines worked and found rich in copper and tin were those at the foot of the granite hills, and then those lying next to them. It was thought, however, by the miners of those days that the ground still further north was beyond the circle in which metals would be found in sufficient abundance to be remunerative, and, therefore, that it would be only wasting capital to give it a trial. A great change has, however, since come over the mind of the mining world in this respect, and it has since been found that conditions which were formerly disregarded have a very important effect in rendering lodes highly productive of metals. One of the most important, and now most generally recognised, of these is the existence of the elvan rock in proximity to a lode, and traversing the stratum in which it is embedded in a nearly parallel line, so as to form a junction with it at varying depths. This has been found a position equally favourable, with immediate proximity to the line of junction of the granite and killas rocks.

The following are some particulars respecting the mines which have been named, and which form one of the richest mining districts in the world:—

Dolcoath is one of the oldest mines of this locality, and was for many years the richest copper mine in England. In its modern working it has given dividends to the amount of 235,385*l.*, but must have yielded altogether profits to the amount of half a million sterling. In depth it became exhausted of copper and productive of tin, of which metal it is now the greatest and richest mine in Cornwall. The richness of the lode in tin has increased with increased depth, the best part of the mine being about 300 fathoms from the surface, beyond which explorations are still being pushed on, the deepest point being about 310 fathoms from the surface. The present returns of tin are of the value of about 66,000*l.* per annum, leaving a profit of about 20,000*l.* per annum, exclusive of some 3000*l.* per annum paid as royalty to the owner of the soil. The market value of the mine is 196,900*l.*

Stray Park and Camborne Vean are the next mines west from Dolcoath, on the same lodes, and have been sometimes worked together, and at other times separately. The amount of profits which they have conjointly given is not exactly known, as they are very old mines, and the records of their earlier workings are not easily, if at all, obtainable; it is supposed, however, to be about 200,000*l.*

Cook's Kitchen is immediately east of Dolcoath, on the same lode, and gave profits from copper to the extent of about 200,000*l.* Like Dolcoath, however, and all the deep mines of the same locality, it ceased to produce copper in depth, and was for a long period unremunerative, until the tin-yielding depth was reached, since which it has resumed paying dividends. Its market value is now 73,500*l.*

Tincroft, the next mine east, has given over 300,000*l.* in profits, a great proportion of which was from copper, but the returns are now principally tin, from which good dividends are being made. The market value of this mine is 54,000*l.*

Carn Brea: These mines are next east from Tincroft, and have made the greater part of their profits from copper, but the principal returns now are tin. On an outlay of 15,000*l.* they have divided profits to the amount of 271,500*l.*, and have a market value of 71,500*l.*

South Roskear Mine, which adjoins Dolcoath on the north, is supposed to have given about 200,000*l.* in profits, but records of the earliest workings, in which the great profits were made, are not obtainable. It did not sustain its productive character in depth, and was abandoned some years since.

The first trial of the mining ground lying to the north of those mines already mentioned, of which East Wheal Seton forms a part, was made in North Roskear, in which, owing to the confidence expressed by Captain Joseph Vivian, the present manager, that good results would be met with, operations have been conducted under his charge with great spirit and vigour, and on an outlay of 7000*l.*, 110,000*l.* have been returned to the shareholders in dividends. This mine is in hard rock, notwithstanding which, so rapidly has it been developed that the engine-shaft has been sunk from the surface to a depth of 267 fms. Altogether about 1900 fms. of shafts have been sunk, and over 20 miles of levels driven, in addition to the large area of the lodes taken away as ore ground. From these facts some idea may be formed of the quantity of copper and tin ore which must have been extracted to defray the cost of operations so extensive; and the immense sum of money realised from which, after giving a profit of 110,000*l.* to the shareholders, has been distributed between the lords of the soil, the labourers, merchants, and shopkeepers of the neighbourhood. The benefit thus conferred on all classes of the community owe their origin to the decided opinion which Capt. Joseph Vivian expressed in the face of adverse opinions, that success would certainly be met with, and to the energy and skill which he has displayed in developing the property.

The prosperity met with in North Roskear led to the working of East Wheal Crofty (now called North Wheal Crofty), which adjoins it on the east, and equally good results soon followed, large courses of copper ore having been discovered very near the surface, and near the junction of the lode and elvan course, from which over 90,000*l.* were divided amongst the fortunate shareholders. This mine was under the management of the late Capt. Nicholas Tredinnick. It is now being worked under the management of Capt. Joseph Vivian, the principal resources being tin, at levels below where the lode ceased to produce copper, and such good discoveries have been lately made in this department that profits are now being realised, and dividends may be looked forward to with confidence.

East Wheal Crofty induced the working of East Pool, where, on an outlay of 3104*l.*, dividends to the amount of 39,040*l.* have been declared, and the mine is still making large returns of copper and tin, from which further profits are likely to be derived.

North Pool followed as a consequence of East Pool, and the profits realised were 61,450*l.*, on an outlay of 8180*l.*

The ground now occupied by the Setons remained unnoticed until the great discoveries which were made in North Roskear directed attention to it. One of the richest lodes in the last-named mine was found, after forming immense courses of copper ore both in North Roskear and East Wheal Crofty, to pass in going west into the ground now called Wheal Seton, the value of which was thus pointed out. A sett of it was obtained by Mr. Tilly, the solicitor and steward of Mr. Seton, and great credit is due to him, as the purser of the mine, for the indomitable perseverance with which the explorations were conducted, and for the great success with which they were rewarded. The dividends declared by this mine amount to 52,173*l.*, and large quantities of copper and tin continue to be returned. Fresh discoveries having been recently made, the shares now command a market value for the whole concern of about 45,000*l.*

West Seton was next started, and although at first presenting but little indication of riches, the lode being near the surface of a very unfavourable character, has since turned out the richest of the group. It has already divided 135,200*l.*, and continues to make regular and large dividends, commanding a market value at present of 152,000*l.* The next mines to notice as forming a very important part of the same district, and prominent members of the Seton group, are New Wheal Seton and East Wheal Seton. The former of these is immediately west of and adjoining West Wheal Seton, and the latter immediately east of and adjoining Wheal Seton.

New Wheal Seton will probably be found rich and profitable at deeper levels than have yet been reached, the ore being found deeper as the lodes go west, corresponding with the dip of the junction of the lode with the elvan (as has been already pointed out). The operations are being vigorously developed in depth, and the property already has a market value of about 26,000*l.*

It will be seen from the foregoing remarks that the development of this mining field has been gradual, one mine following naturally as the result of another, and of East Seton it may be said that all its features are of the most favourable character—its position, the lodes by which it is traversed, and the additional advantage, which the other Setons do not possess, of the lode coming in contact with the elvan very close to the surface, thus affording the best possible chance of great discoveries of copper being made by a small outlay, and in a short time. All the circumstances by which this mine is surrounded point it out as destined to occupy the same position in the future history of the rich district in which it is situated as those others, which have already given so much wealth, have done in the past. But East Wheal Seton shares, 5610 in number, command at present only a market price of from 8s. to 10s., or about 2500*l.* for the whole mine; whilst New Wheal Seton, with less apparent advantages, has a market value of 65*l.* per share for its 400 shares, thus making it a property worth 26,000*l.* This great discrepancy, however, between the value of the two mines cannot be accounted for on any reasonable grounds, nor can it continue to exist, for East Wheal Seton is certain to find its true level in the market on its merits becoming known.

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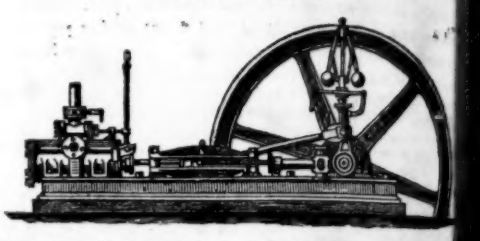

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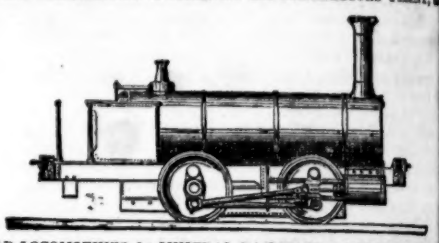

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